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[redacted] log # 23-71 25X1

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[redacted]

January 11, 1971

ACTIVITY SUMMARY

To: John C.

From: [redacted] 25X1

Subject: Activity Summary
Facility Visit, [redacted]

Reference: [redacted]2201201-AS-23 25X1

Date: 5 January 1971

This visit was made by [redacted] to the sponsor facility. 25X1 The primary objective was to organize the continuing optical image manipulation program based on accomplishments to date, to continue demonstration of operational significance and to continue development of sponsor laboratory experience and capabilities. The program outline is presented below.

Since the last activity summary, reference [redacted]2201201-AS-22 25X1 dated December 10, 1970, several program visits were undertaken. On December 16, 1970 a technical briefing was given at the sponsor's facility by [redacted] 25X1 on the accomplishments of this program. On December 29, 1970, [redacted] 25X1 and [redacted] 25X1 visited the customer's facility regarding program direction, to best utilize the accomplishments obtained relative to customer objectives.

The program outline given here is specific to the sponsor lab activities and is based on long term objectives over the next fourteen months. The sponsor's manpower requirement for this program is estimated at 2.0 man years of technical personnel with 1.0 man year of laboratory support personnel. 25X1 [redacted]

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support will be maintained as previously described. It is evident on review of the program outline, that accomplishments and level of effort are closely related. The broad areas that entail optical image manipulation technology require the considerations and experiments outlined on the attached pages.

PROGRAM OUTLINE

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Item Description	Months from Jan, 1971	Objective
1. Amplitude filter, high frequency enhancement.	0-14	To continue application of OIM on operational material at macro and micro scales, to incorporate and apply advances in filter design developed by [redacted] during program, and to measure system behavior.
a) Operational imagery, target selection and O.I.M.	(0-4)	
b) System measurements, sine wave targets, edge targets and analysis	(1-4)	
c) Continued OIM application to operational material on a low volume basis and to apply micro-optical systems for real-time viewing of processed operational material.	(4-14)	
2. In-line Coherent Optical Processing	1-9	To incorporate at sponsor's facility capabilities for in-line coherent optical image manipulation for removal of complex aberrations from operational imagery.
a) Development of techniques for fabrication of complex optical filters utilizing phase relief image and function generation	(1-3)	
b) Design of defocus and image motion filters for customer specific usage based on [redacted] development.	(2-3)	
c) Generation of series of filters for laboratory applications	(3-6)	
d) Application of in-line processes to laboratory prepared and operational imagery	(4-9)	

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Item Description	Months	Objective
3. Holographic coherent optical processing.	6-11	To incorporate at the sponsor laboratory techniques and capability to apply holographic optical processes to complex optical image manipulation.
a) Utilize progress gained in holography during first months of program, set-up systems for generation and application of hologram filters.	(6)	
b) Design experiments that will demonstrate holographic capability and compare response with in-line coherent filters.	(6-7)	
c) Application of holographic processes to laboratory prepared imagery and operational imagery.	(7-11)	
4. Hybrid image manipulation considerations	8-13	To assess, for sponsor system objectives, potential of hybrid image manipulation for increases in manipulation capability, in filter generation, and space-bandwidth product of processed imagery.
a) Review and assess the state of technology and relative attributes of hybrid image manipulation procedures.	(8-9)	
b) Design experiments to demonstrate capability using available facility. One potential method is computer generation of a binary van der Lught type optical filter. A second potential method is to procure a specified computer generated filter from the Patrick AFB facsimile generator.	(9-10)	

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Item Description	Months	Objective
c) Application of hybrid processes to experiment designed to assess potential of hybrid methodology, as related to information storage capabilities, flexibility of filter generation, and increased space-babdwidth product.	(10-13)	
5. OIM applications to polychromatic imagery	11-14	To incorporate at sponsor's facility developments in polychromatic OIM
a) Set-up capability in OIM amplitude filter systems for polychromatic image processing based on utility and developments at [redacted]	(11-12)	25X1
b) Apply OIM to polychromatic imagery either as individual color separation transparencies or as a three layer tri-chromatic input.	(12-14)	

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